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Army SRB Program: Estimates of Effects on Retention (Revised) and Length of Reenlistment

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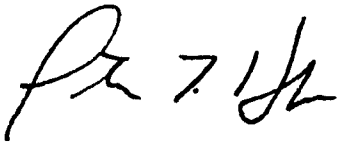

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14. ABSTRACT *(Maximum 200 words)*:

In this study the effects of Selective Reenlistment Bonuses (SRBs) on Army reenlistments over the 1990-2000 period at Zones A, B, and C at three levels of occupational aggregation – all Army, career management field (CMF), and military occupational specialty (MOS) – were re-estimated to explicitly control for the drawdown in the mid-1990s as well as labor market conditions. In general, the results for Zone A at all levels of occupational aggregation indicate that reenlistment bonuses have a positive and statistically significant effect on Zone A reenlistments. A one-level increase in SRB at Zone A typically increases the reenlistment rate by 3 to 7 percentage points, depending upon the occupation. The results for Zone B are also solid at both the CMF and MOS levels. Results for Zone C, where reenlistment rates are typically very high, were reasonably solid but not quite as good as the Zone A and B results. The results provide the Army with estimates of reenlistment responsiveness to bonus changes for all three zones for all MOS.

We also estimated the effect of SRBs on the reenlisting Soldier's choice of length of reenlistment. Increases in the SRB level not only increase reenlistments, but also increase the length of reenlistment. The length of reenlistment effects were incorporated into the SRB Management System to better predict program costs and the additional staff years of contracted service provided by the bonus program.

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ARMY SRB PROGRAM: ESTIMATES OF EFFECTS ON RETENTION (REVISED) AND LENGTH OF REENLISTMENT

EXECUTIVE SUMMARY

Research Requirement:

The Selective Reenlistment Bonus (SRB) program is the primary way the Army provides financial reenlistment incentives that vary by occupational specialty. Under the SRB program, the Army sets an SRB level (ranging from zero to eight) by military occupational specialty (MOS) for Soldiers at a first reenlistment point (Zone A), second reenlistment point (Zone B), and third reenlistment point (Zone C). The Soldier is then offered a cash bonus equal to the award level multiplied by the member's monthly basic pay and by the number of years (between 3 and 6) that the member chooses to reenlist. For the period of analysis, half of the bonus was paid to the member at the time of reenlistment, while the remaining half was paid in equal anniversary payments over the term of reenlistment.

Efficient allocation of reenlistment bonuses requires the ability to estimate the effect that the bonus will have on reenlistments in an occupational specialty. The purpose of the research reported in this paper is to provide revised estimates of the effect of reenlistment bonuses (by occupations and reenlistment zone) upon retention, and to examine the relationship between size of bonus and contract length. The resulting parameter estimates are to be incorporated into the Army's SRB Management System (HRC/EPMD/Force Alignment Division).

Procedure:

In the analysis of the effect of selective reenlistment bonuses on Army enlisted retention, we modeled the decision as a rational choice by the Soldier to remain in the Army or to leave based on the benefits and costs associated with the alternatives. We applied the Annualized Cost of Leaving Model (ACOL) to estimate the financial incentive to stay. This model estimates the financial incentive to stay as the difference in annualized military and civilian pay, computed from the decision point to an optimal time horizon. The SRB was included in the ACOL computation. The econometric model was estimated as a logistic regression.

The Army provided data on reenlistment decisions made in FY1990 through FY2000. We received annual extracts of the Enlisted Master File (EMF) for September 1989 through September 2000 and extracts of the Enlisted Loss File for the 11 fiscal years in the study. We used these data to identify Soldiers eligible to make stay/leave decisions, characterize their decisions, and generate explanatory variables for the estimation. We generated individual records for each reenlistment decision observed in the analysis period.

Findings:

We estimated the effects of SRBs on reenlistments at Zones A, B, and C at three levels of occupational aggregation—all Army, career management field (CMF), and MOS. After out-of-

sample testing indicated that the original (2002) model could be improved, we re-estimated the model. In particular, the revised model explicitly controlled for the mid-1990s drawdown period and facilitated detection of labor market effects in the retention model estimation. In general, the results for Zone A at all levels of occupational aggregation indicate that reenlistment bonuses have a positive and statistically significant effect on Zone A reenlistments. The magnitude of the effect varied by occupation, but a one-level increase in SRB at Zone A typically increases the reenlistment rate by 3 - 7 percentage points, depending upon the occupation. The results for Zone B are also solid at both the CMF and MOS levels. Results for Zone C, where reenlistment rates are typically very high, were reasonably solid but not quite as good as the Zone A and B results. We were unable to obtain positive, statistically significant ACOL parameter estimates for a small number of CMF/MOS. The reason is probably the lack of variation in bonuses at this zone. Nevertheless, we provided the Army with estimates for all three zones for all MOS. In the case of Zone C, however, we sometimes relied on higher-level occupational aggregations to obtain estimates.

In addition, we estimated the effect that SRB has on the reenlisting Soldier's choice of length of reenlistment. We found the increase in the SRB level will not only increase reenlistments, but also increase the length of reenlistment. The estimated effects of the bonus on length of reenlistment were incorporated into the SRB Management System to better predict the costs of the program, and to estimate the additional staff years of contracted service provided by the bonus program.

Utilization and Dissemination of Findings:

These results will be used to update the embedded parameters in the SRB Management System, which assists the Army plan and execute its SRB program. The SRB Management System estimates the effects on reenlistments, and calculates the bonus costs, associated with alternative plans.

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ARMY SRB PROGRAM: ESTIMATES OF EFFECTS ON RETENTION (REVISED) AND LENGTH OF REENLISTMENT

Introduction

The U.S. Army Research Institute for the Behavioral and Social Sciences (ARI), together with its contractor team of HumRRO, SAG Corporation, and the Lewin Group, has been working with Human Resources Command to assist Selective Reenlistment Bonus (SRB) managers in the management of the SRB program. Toward this end a web-based Army SRB Management System has been designed and developed (Mackin and O'Brien, 2005). There are two key components to the System. The first component is the mathematical modeling system that incorporates the structure and logical relationships of the SRB program, databases and data flow logic, and a user-friendly interface for planning and policy analysis. The second component consists of quantitative estimates of the behavioral relationships between selective reenlistment bonuses, contract length, reenlistments, and program costs. These estimated relationships provide the empirical foundation of the SRB Management System.

The purpose of this paper is to present revised econometric estimates of the effects of selective reenlistment bonuses on reenlistments, and new results for the effects on contract length. Hogan et al. (2005) describes the original (2002) econometric estimates of the effect of SRB on reenlistments. In addition, we analyze the effect of SRB and other factors on the choice of contract length that, in addition to the decision to reenlist, is another important policy consequence of the SRB program. Other things being equal, the Army would prefer Soldiers to commit to reenlist for longer periods. Because the amount of reenlistment bonus a Soldier receives increases with length of reenlistment, the SRB program provides an incentive for Soldiers to reenlist for longer periods. We present estimates of the effect that various bonus levels have on contract length using different econometric models. The selected model estimates are incorporated as parameters into the SRB Management System itself, permitting more accurate estimates of the cost of alternative SRB programs, and estimates of one dimension of the benefits—contracted staff years.

Reenlistment Models

The Theory of Reenlistment Behavior

In the theory underlying the reenlistment model, the decision to reenlist is a rational decision based on the benefits and costs associated with the alternatives. The most important explanatory variable is the Annualized Cost of Leaving (ACOL) variable that represents the maximum of annualized differences between military and civilian pay for each Soldier. In addition, the model includes Soldiers' demographic characteristics including gender, race, education, Armed Forces Qualification Test (AFQT) score, and marital status.

The data consist of individual observations of Soldiers at Zone A, B, and C reenlistment points, by MOS, over the years FY1990 through FY2000. To improve the original model, we added the national unemployment rate as well as dummy variables that control for the effect of

the armed forces drawdown (which occurred around 1992-1996.)[1] By controlling for the period of the drawdown, during which Soldiers may have been encouraged not to reenlist, we were able to estimate the effects of the economy on voluntary reenlistment decisions.

When the civilian job market is tight (characterized by a low unemployment rate) there will be better civilian opportunities for Soldiers, inducing some to leave. Conversely, when the civilian economy is weak (characterized by high unemployment rates) more Soldiers will choose to reenlist. However, this relationship may have been obscured by the drawdown, during which some Soldiers were encouraged not to reenlist. By controlling for this period, the relationship between the reenlistment decision and the state of the economy could be estimated.

The rationale is that when the civilian economy was poor, more Soldiers would choose to stay with the Army and sign up for reenlistment. On the other hand, the drawdown is similar to downsizing, with the organization indicating that many employees are no longer as valued as they once were. In the Army, this will have a negative effect on the number of voluntary reenlistments, especially for those Soldiers that have reasonably attractive civilian alternatives.

Reenlistment Model Estimation Results

The estimation results of the revised model were noticeably improved compared to those of the original model. With the inclusion of the drawdown dummy variables and the unemployment rates, we obtained statistically significant and correctly signed coefficients for the ACOL variables in a greater number of equations, and we also obtained significant results for the unemployment rate in many cases. At the all-Army level, as Table 1 indicates, almost all explanatory variables are significant in the equations for all three zones. These results appear to be an improvement over the original model where the significance of the ACOL variable was sensitive to the inclusion of demographic variables.

We calculated the responsiveness of the reenlistment rate to the change in SRB, based on the following equation:

$$\frac{\partial R}{\partial SRB} = \frac{\partial R}{\partial ACOL} * \frac{\partial ACOL}{\partial SRB}$$

where R is the reenlistment rate, SRB is the selective reenlistment bonus award level, and $ACOL$ is the annualized cost of leaving. Recall that, for a logit,

$$\frac{\partial R}{\partial ACOL} = R * (1 - R) * B$$

Where R is the reenlistment rate evaluated at the mean and B is the ACOL coefficient.

[1]Controlling for the effects of the drawdown with dummy variables was necessary to estimate the effect of the unemployment rate on reenlistments.

Table 1. All-Army Results of the Reenlistment Model

	Zone A		Zone B		Zone C	
	Estimate	SE	Estimate	SE	Estimate	SE
Intercept	-2.2968***	0.0734	-0.7931***	0.082	3.5492***	0.1243
ACOL	0.000361***	0.000007537	0.000209***	0.000006901	0.000075***	0.000008343
Unemp. Rate	0.0299***	0.00525	0.0145**	0.00689	-0.3517***	0.0112
AFQT	-0.00535***	0.000157	-0.00047**	0.000229	-0.00392***	0.000403
Female	0.2513***	0.00845	0.00248	0.0126	-0.0283	0.0235
Non-white	0.5625***	0.00618	0.3586***	0.00915	0.2076***	0.0166
Separated	-0.07***	0.0205	-0.1012***	0.0189	-0.2035***	0.0273
Single	-0.495***	0.00633	-0.1786***	0.0102	-0.1632***	0.0252
GED	0.508***	0.0245	-0.2955***	0.0335	-0.4353***	0.0528
HS Grad	0.2323***	0.0197	-0.1734***	0.0277	-0.3202***	0.0448
Non-HSG	0.4358***	0.0332	-0.4694***	0.068	-1.1724***	0.1242
Some College	0.2329***	0.0213	0.1819***	0.0291	0.1957***	0.0458
Post-drawdown	0.5818***	0.0138	0.4245***	0.0172	-0.4688***	0.0292
Pre-drawdown	0.2318***	0.012	0.8596***	0.0155	0.5742***	0.025
Percentage point change in reenlistment rate from a one-level increase in SRB	6.4		4.5		1.8	

** $p < .05$, *** $p < .01$

The responsiveness of reenlistment to SRBs at the all-Army level, as reported in the bottom row of Table 1, is somewhat greater than the original estimate. The average effect of a one-level increase in SRB in the all-Army model is to increase the first term reenlistment by about 6.4 percentage points, the second term by about 4.4 percentage points, and the third term by about 1.8 percentage points, calculated at the respective mean reenlistment rates. The results for the unemployment rate and drawdown dummies are generally as expected. Higher unemployment rates are associated with higher reenlistment rates. The reenlistment rate was significantly lower at Zone A and Zone B during the drawdown period, though this was not the case for Zone C. The effects of the demographic variables are similar to the original estimates for Zone A. (Demographic variables were not included in the original estimates for Zone B or C.) Women, non-whites, and married members have higher propensity to reenlist, while college graduates have the lowest propensity to reenlist. However, the effect of education is different for Zone B and Zone C, compared to Zone A, where college graduates and members with "some college" are *more* likely to reenlist.

We also estimated the model and calculated SRB effects on the reenlistment rate at the CMF level and the MOS level. Table 2 presents the estimates of the ACOL coefficient for the largest 19 CMF, and Table 3 reports the effect of a one-unit increase in the SRB on reenlistment rates. Similarly, Table 4 and Table 5 show the ACOL coefficients and one-unit SRB effects for the largest 20 MOS, respectively. We omit the coefficient if the ACOL coefficient was negative. Note that this occurred in very few cases.

Finally, we compare the new results with the original 2002 results in Table 6. The revised results suggest significant improvement, compared to the original estimates, at both the CMF and MOS level and across all zones.

Table 2. ACOL Coefficients of the Largest 19 CMF

	Zone A		Zone B		Zone C	
CMF	Estimate	SE	Estimate	SE	Estimate	SE
11	0.000397***	0.00002	0.000302***	0.000023	0.000128***	0.000029
12	0.000247***	0.00004	0.000224***	0.000047	0.000108*	0.000059
13	0.000399***	0.000026	0.000254***	0.000028	0.000076**	0.000035
14	0.000197***	0.000051	0.000196***	0.000056	———	———
19	0.00051***	0.00003	0.000253***	0.000036	0.000129***	0.000041
31	0.000305***	0.000029	0.000183***	0.000026	0.000088***	0.00003
51	0.000374***	0.000059	0.000193***	0.000054	0.000095	0.0.0066
63	0.00027***	0.000021	0.000172***	0.00002	0.000053**	0.000026
67	0.000387***	0.000064	0.000321***	0.00003	0.000104**	0.000045
71	0.000448***	0.000034	0.000109***	0.000026	———	———
76	0.000644***	0.000064	0.000277***	0.00005	0.000035	0.000049
77	0.000124***	0.000045	0.000243***	0.000049	———	———
88	0.000239***	0.000039	0.000196***	0.000036	———	———
91	0.000458***	0.00003	0.000154***	0.000022	0.000079***	0.000028
92	0.000178***	0.000028	0.000178***	0.000028	0.000043	0.000038
94	0.000688***	0.000068	0.000258***	0.000059	0.000186**	0.000072
95	0.000291***	0.000039	0.000206***	0.000032	0.000136***	0.000036
96	0.00017**	0.000067	0.000161***	0.000054	0.000203***	0.000059
98	0.00027***	0.000059	0.000153***	0.000054	0.000177***	0.000054

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 3. Effect of One-Level Increase in SRB, CMF Level

CMF	Zone A	Zone B	Zone C
11	0.066410	0.064266	0.029539
12	0.041708	0.050370	0.024924
13	0.003961	0.056037	0.017539
14	0.033767	0.042633	———
19	0.085555	0.052423	0.029770
31	0.052871	0.040373	0.019709
51	0.064296	0.042579	0.021633
63	0.046996	0.037946	0.012231
67	0.067146	0.076370	0.019229
71	0.074034	0.024047	———
74	0.105396	0.061111	0.008077
77	0.021791	0.051067	———
88	0.041980	0.043241	———
91	0.080047	0.033718	0.029719
92	0.029131	0.039270	0.007105
94	0.119665	0.056919	0.041587
95	0.050578	0.045447	0.030218
96	0.029576	0.035226	0.044230
98	0.045653	0.036316	0.043657

Table 4. ACOL Coefficients of the Largest 20 MOS

	Zone A		Zone B		Zone C	
MOS	Estimate	SE	Estimate	SE	Estimate	SE
11B	0.000387***	0.000028	0.000302***	0.000031	0.000171***	0.00004
11C	0.000306***	0.000059	0.000296***	0.000072	———	———
11M	0.000415***	0.000038	0.000269***	0.000043	0.000095*	0.000056
12B	0.000215***	0.000043	0.000205***	0.000052	0.000084	0.000067
13B	0.000589***	0.000036	0.00026***	0.000039	0.00007	0.000049
19D	0.000678***	0.000051	0.00023***	0.000059	0.000124*	0.000073
19K	0.000419***	0.000038	0.000292***	0.000046	0.000093*	0.000052
31U	0.000274***	0.000063	0.000209***	0.000058	0.00016*	0.000086
52D	0.00026***	0.000068	0.000124**	0.000059	0.000061	0.000086
54B	0.000364***	0.000072	0.000222***	0.000063	0.00001	0.000059
63B	0.000195***	0.000042	0.000189***	0.000041	0.00000003646	0.000048
71L	0.000463***	0.000055	0.00009**	0.000042	———	———
76Y	0.000679***	0.000107	0.000327***	0.000083	0.00009	0.000075
77F	0.000108**	0.000047	0.00024***	0.000053	———	———
88M	0.00024***	0.000047	0.000201***	0.000042	———	———
91B	0.000323***	0.000041	0.000018	0.000039	———	———
92A	0.000198***	0.000047	0.000229***	0.000042	———	———
92Y	———	———	0.00023***	0.000051	0.000158**	0.000066
94B	0.000697***	0.000068	0.000261***	0.000059	0.000185**	0.000072
95B	0.000253***	0.000041	0.000196***	0.000033	0.000108***	0.00004

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 5. Effect of One-Level Increase in SRB, MOS Level

MOS	Zone A	Zone B	Zone C
11B	0.064748	0.065294	0.029304
11C	0.051022	0.061568	———
11M	0.069357	0.058595	0.016742
12B	0.036598	0.045557	0.015686
13B	0.100719	0.054406	0.013071
19D	0.113579	0.047179	0.023155
19K	0.070678	0.060736	0.017366
31U	0.046976	0.043734	0.034515
52D	0.045198	0.025947	0.011391
54B	0.063700	0.042812	0.001867
63B	0.034125	0.039549	0.000007
71L	0.076102	0.018833	———
76Y	0.118651	0.068426	0.016806
77F	0.018900	0.050221	———
88M	0.041953	0.040961	———
91B	0.056525	0.003767	———
92A	0.033946	0.047919	———
92Y	———	0.048128	0.022906
94B	0.121975	0.054615	0.034546
95B	0.043826	0.041014	0.024341

Table 6. Summary Comparison of the ACOL Coefficients from the Revised Model and the Original Model

Specification		No. of results statistically significant and positive					
		CMF level			MOS level		
		Zone A	B	C	Zone A	B	C
Rev. model	Has unemployment rate & drawdown year dummies	All 19	All 19	12	19	19	8
Orig. model	No unemployment rate or year dummies	17	6	5	17	4	2

We also predicted the reenlistment rate for each year group using estimates from the revised model and estimates from the original model. Subtracting the predicted rates from the actual rates (calculated using the same data) yields the residuals of the prediction. We did this for Zone A because—while both models seem to have yielded reasonably good results for Zone A—the original model did not produce many useful results for Zone B and C. Hence, to the extent that this experiment indicates the improvement of the revised model, this improvement is likely to be greater were Zones B and C considered. Table 7 summarizes the residuals and indicates that out of the 11 years, the revised model provided better predictions for 7 years while the original model provided better predictions for 4 years. The revised model's performance is more consistent over the years, as the range of the residual is much smaller (-6.7%, 5.3%) compared to original model (-11.8%, 9%).

Table 7. Prediction Residuals from the Revised Model and from the Original Model (Zone A only)

FY	Actual reenlistment (%)	Prediction (%)		Residual (%)	
		Orig. model	Rev. model	Orig. model	Rev. model
1990	39.0	41.8	40	2.8	1.0
1991	40.8	40.7	39.2	-0.1	-1.7
1992	36.4	45.4	41.7	9.0	5.3
1993	47.0	45.8	42.8	-0.5	-4.1
1994	48.9	49.6	46.6	0.7	-2.3
1995	45.5	49.5	46	4.0	0.4
1996	46.2	49.9	45.8	3.8	-0.4
1997	54.4	45.9	52.6	-8.6	-1.9
1998	53.3	41.5	46.6	-11.8	-6.7
1999	52.1	49.4	58.1	-2.7	6.0
2000	55.7	50.1	58.2	-5.5	2.5

The unemployment rate is an important variable in the revised model. We report the estimated coefficients for the largest 19 CMF and 20 MOS in Table 8 and Table 9, respectively. Again we omitted the coefficient if the unemployment coefficient was negative. Other estimation results are available upon request.

Table 8. Unemployment Coefficients of the Largest 19 CMF

	Zone A		Zone B		Zone C	
CMF	Estimate	SE	Estimate	SE	Estimate	SE
11	0.0889***	0.0138	0.0447**	0.0226	———	———
12	———	———	———	———	———	———
13	———	———	———	———	———	———
14	———	———	———	———	———	———
19	0.1065***	0.0235	———	———	———	———
31	0.0406**	0.02	0.0292	0.025	———	———
51	———	———	———	———	———	———
63	0.0121	0.0149	———	———	———	———
67	———	———	0.3127***	0.0316	———	———
71	0.0816***	0.0236	0.0456*	0.0259	———	———
76	0.1621***	0.0357	———	———	———	———
77	———	———	———	———	———	———
88	———	———	———	———	———	———
91	0.0151	0.0198	0.0724***	0.0247	———	———
92	0.2554***	0.0426	0.1065*	0.0559	0.139	0.1039
94	0.1439***	0.0346	———	———	———	———
95	0.0204	0.0284	0.214***	0.0313	0.0462	0.0535
96	———	———	0.1316**	0.0577	———	———
98	0.1546***	0.041	0.0199	0.0523	———	———

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 9. Unemployment Coefficients of the Largest 20 MOS

	Zone A		Zone B		Zone C	
MOS	Estimate	SE	Estimate	SE	Estimate	SE
11B	0.1323***	0.0186	0.066**	0.0302	———	———
11C	0.0217	0.0394	0.1719**	0.072	———	———
11M	0.0788***	0.0283	———	———	———	———
12B	———	———	———	———	———	———
13B	0.0281	0.0249	0.0627	0.0394	———	———
19D	0.1855***	0.0392	———	———	———	———
19K	0.0748**	0.03	———	———	———	———
31U	0.2506***	0.0836	0.3701***	0.1122	0.2889	0.2373
52D	0.0339	0.0456	———	———	———	———
54B	———	———	———	———	———	———
63B	0.0102	0.0278	0.0204	0.0397	———	———
71L	0.2033***	0.0381	0.1029**	0.0411	———	———
76Y	0.145**	0.0598	———	———	———	———
77F	———	———	———	———	———	———
88M	———	———	———	———	———	———
91B	———	———	0.00632	0.0446	———	———
92A	0.3552***	0.0689	———	———	0.016	0.154-
92Y	———	———	0.2732***	0.1019	0.3388*	0.187
94B	0.1482***	0.0345	———	———	———	———
95B	0.0181	0.0293	0.2229***	0.0331	0.0326	0.5806

Models of the Length of Reenlistment (LOR)

While the primary purpose of the SRB program is to induce Soldiers who otherwise might leave to reenlist, it has a second benefit in that it induces those who reenlist to choose longer reenlistment periods. It is important to be able to predict the contract length effect of reenlistment bonuses both for better force planning and to provide a more precise estimate of the cost of a given SRB program.[2]

Data

To estimate the length of reenlistment model, we used the FY1990-2000 data set that was constructed for the SRB study. We included the national unemployment rate published by BLS and three dummy variables that represent pre-drawdown years (FY1990-1991), drawdown years (1992-1996), and post-drawdown years (1997-2000).[3] To expedite the model runs, we used a 20% random sample containing 208,298 observations, of which 123,074 chose to reenlist.[4]

For estimating the length of reenlistment, we constructed several additional variables: the SRB bonus for a 4-year contract (bonus4), the present value of the bonus, the real present value of the bonus, and a set of dummy variables indicating if the SRB *first* reached the ceiling under a 3-, 4-, 5-, or 6-year contract.[5] We used bonus4 as a proxy for the level of SRB bonus because the most frequently chosen contract length is 4 years. We calculated "bonus4" based on each individual's pay grade, years of service, and the SRB award level for which the Soldier is qualified in a given year. When the SRB award level increases, the present value of the bonus over a 4-year contract increases. It is the relationship between bonus value and length of reenlistment that we attempted to measure. However, the highest value of bonus4 is $20,000 because that was the SRB ceiling for the period of our analysis. That is, if the computed value of the bonus, based on grade, award level, and contract length exceeds $20,000, we set the value equal to the ceiling value of $20,000. In the calculation of the present value of SRB, we assumed an individual discount rate of 10% and discounted the annual installment of SRB payments to the value at the beginning year.[6] The real present value of SRB further adjusted the present value by the consumer price index (CPI) to constant, 1990 dollars.

Models

There has been only one (unpublished) study on the length of reenlistment and SRB in the literature. Warner and Goldberg (1984) estimated a linear regression model and a logit model

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[2] Recall that the bonus is equal to the product of (monthly) basic pay, bonus award level, and the length of reenlistment (in years).

[3] For data description and variable construction of the other variables, see Hogan et al. (2005).

[4] To ensure that the sampling did not introduce bias or reduce efficiency, we estimated several models with both the entire data set and the sample. The results were very similar.

[5] The Army has established a "ceiling" for the total bonus that can be paid that supersedes the value calculated from the formula. The ceiling, however, is binding only in rare cases where there is a very high bonus award level.

[6] Recall that the discount rate used in calculating the ACOL variable for the stay/leave decision was 16%. There is no evidence on the appropriate discount rate to use in analyzing contract length choices. The 10% rate is used for convenience. Because the observed choices of contract length are conditional on reenlisting, one would expect that the average discount rate for those who reenlist is someone lower than the unconditional average. The reason for this expectation is that those who choose to reenlist probably discount future retirement payments less than those who do not choose to reenlist.

consisting of three log-odds equations.[7] They found that LOR decisions are positively and significantly related to bonus levels and to the form of the bonus payment. However, the results from both the linear regression model and the multinomial model may be subject to bias because they do not take into account the selection process (i.e., we only observe LOR for members who chose to reenlist). There has been no other empirical research on this issue.[8]

We estimated four models that seem plausible for modeling the choice of LOR: (1) an ordinary least square (OLS) regression model, (2) a Heckman selection model, (3) a maximum-likelihood multinomial logistic (mlogit) model, and (4) a maximum likelihood ordered logit (ologit) model:[9]

$$LOR = f(\text{Bonus (real present value of the bonus under a 4-year contract), gender, AFQT, race, education, marital status, military drawdown, reenlistment zone),}$$

where the functional form, $f(....)$, varies among the four models.

The unemployment rate and the ACOL variable are in the reenlistment model but not in the LOR equation. ACOL is not in the LOR equation because we assume that once people decide to reenlist after considering the annualized cost of leaving, it is the bonus itself that will largely determine the length of reenlistment. We also assume that the state of the economy is not likely to have a significant impact on the length of reenlistment. This is based on the presumption that the contract length constrains the Soldier from leaving. The Soldier believes that he or she can always extend a reenlistment or reenlist in the future. Hence, the Soldier prefers short contracts to longer contracts, all else being equal. It is not assumed that the Soldier believes that the contract length is a form of job security for which a longer contract is preferred to a shorter contract.

Once an SRB amount reaches the Army's ceiling level—the maximum total amount it will pay—the incentive for additional contract length is eliminated. To control for and estimate the effect of SRB ceiling on LOR, we estimated the models with a set of dummy variables indicating whether the SRB ceiling was binding under a 3-, 4-, 5-, or 6-year contract. However, less than 1% of the observations ever reached the SRB ceiling. Because of this, we did not obtain significant results for the "cap" dummies included in the models. Therefore, we proceeded with the models without these dummy variables.

Summary of the Estimation Results

All four models yielded significant results for all our explanatory variables except for some education dummy variables and AFQT in the Heckman model and MLOGIT model. The directions of the effects of the explanatory variables are generally consistent across models.[10] To

[7] The equations were similar to a multinomial logit.

[8] One cannot reenlist for more than 72 months. Hence, the dependent variable is censored. We do not believe that this significantly affects the results. Moreover, the discrete choice models do not suffer from this problem.

[9] In the case of the Heckman model, this is the second step equation.

[10] Note that the interpretation of the signs for results of MLOGI model is different from that under the other models. See discussion in the sections on MLOGIT model for details.

demographic characteristics such as male, white, married, pre- and post-drawdown years, Zone B, and Zone C. The only exceptions are "married" and "post-drawdown" in the Heckman model and the drawdown variables in the MLOGIT model. In the Heckman model, "married" and "post-drawdown" exhibit positive signs in the reenlistment equation, but have negative signs in the LOR equation after having been adjusted for the selection effect. As for the drawdown variables in the MLOGIT model, both the probability of contracts shorter than 48 months and the probability of contracts longer than 48 months rise in pre-drawdown and post-drawdown years. This counter-intuitive result is probably caused by an important property of the MLOGIT model – it does not take into account the fact that the choices of LOR are rank-ordered. The following subsections discuss each model's results in more detail.

The OLS Model

We started with this simple model that neglects certain econometric problems. However, the results may still offer insight on the relationship between LOR and the explanatory variables. The results also serve as a backdrop from which to compare results from the other, more sophisticated models.

We summarize the OLS results in Table 10. According to Table 10, the bonus has a significant and positive effect on the length of reenlistment. Females and non-whites, although more likely to reenlist according to the reenlistment model, tend to reenlist for shorter terms. On the other hand, those with lower AFQT scores and those who are married are more likely to both reenlist and to reenlist for a longer time. Drawdown again has a negative impact on LOR. Members in Zone A tend to commit for shorter reenlistment periods than their counterparts in Zone B and Zone C.

Table 10. Results from the OLS Regression Model of Length of Reenlistment (Dependent Variable = Length of Reenlistment in Months)

Independent variable	Coefficient	t-stat
Bonus	0.0014755***	69.83
Female	-2.026536***	-16.68
AFQT	-0.0134057***	-5.70
Non-white	-0.7380958***	-8.06
Non-high school graduate	-0.5968151	-1.03
GED	-0.4543827	-1.36
High school graduate	-1.370816***	-4.98
Some college	0.5130197*	1.79
College graduate	Omitted variable	
Single/separated	-1.250486***	-13.76
Married	Omitted variable	
Pre-drawdown	5.262623***	47.92
Post-drawdown	0.5271567***	5.63
Drawdown	Omitted variable	
Zone B	2.827503***	28.68
Zone C	8.912168***	72.91
Zone A	Omitted variable	
Constant	39.85984***	117.92
Adjusted R-squared	0.1079	

Heckman Selection Model

We observe the reenlistment lengths only for those who reenlist. However, a higher bonus award level will both increase the average length of reenlistment for those who would have reenlisted at a lower SRB award level and induce additional reenlistments. The reenlistment period chosen by the induced reenlistments may not be the same as that for those who would have reenlisted anyway. Hence, imputing the length of reenlistment for those induced to reenlist based on the reenlistment choices of those who would have reenlisted even without the bonus increase may overstate the average effect of bonuses on reenlistment length.

To correct for this potential selection effect, we estimated a Heckman 2-step selection model in which the first stage is a probit model of reenlistment such that:

> Probability of reenlistment = f(ACOL, unemployment, gender, AFQT, race, education, marital status, military drawdown, reenlistment zone).

The second equation is the OLS regression model for LOR as specified above. The inverse Mills ratio, calculated from the first equation, is included as an explanatory variable in the linear regression to control for selection. The inverse Mills ratio controls for selection because it captures the omitted factors that affect contract length choice.[11]

We summarize the Heckman model results in Table 11. The bonus still has a significant positive effect. The effect is slightly smaller than the OLS estimate, but is unchanged to a first approximation.

Table 11. Results of the Heckman Model

	LOR equation (2nd step)		Reenlistment equation (1st step)	
Independent variable	Coefficient	z-stat	Coefficient	z-stat
Bonus	0.0014698***	70.48		
ACOL			0.0002992***	81.78
Unemployment			0.0353769***	7.46
Female	-2.485818***	-19.09	0.1292082***	14.35
AFQT	-0.0008897	-0.35	-0.002509***	-15.25
Non-white	-2.099457***	-17.50	0.2935858***	44.73
Non-high school graduate	0.4425854	-0.73	-0.0370479	-0.96
GED	-0.9045859***	-2.57	0.0963936***	3.96
High school graduate	-1.224573***	-4.23	-0.00087385	-0.44
Some college	-0.0824854	-0.27	0.1444354***	6.89
College graduate	Omitted variable			
Single/separated	0.6446092***	4.66	-0.2611867***	-39.63
Married	Omitted variable			
Pre-drawdown	5.362511***	46.58	0.3700707***	40.22
Post-drawdown	-0.2659317**	-2.49	0.4033406***	34.07
Drawdown	Omitted variable			
Zone B	1.868715***	17.08		
Zone C	6.26882***	34.28		

[11] Selection bias in a linear regression is equivalent to omitted variable bias. The inclusion of the inverse Mills ratio, calculated from the first equation, captures otherwise omitted factors that are correlated both with other explanatory variables and contract length, reducing the potential bias in the explanatory variables.

Independent variable	LOR equation (2nd step) Coefficient	z-stat	Reenlistment equation (1st step) Coefficient	z-stat
Zone A	Omitted variable			
Constant	45.39956***	99.56	-1.812698***	-36.18
Inverse Mill's ratio	-8.466624***	-19.14		
ρ	-0.55160			
Prob > χ^2	0.0000			

Multinomial Logit Model

The multinomial procedure estimates the relative probabilities of multiple (more than two) discrete choices or outcomes as a function of a set of independent variables. To be parsimonious in the number of equations we have to estimate, we collapsed the lengths of reenlistment into four choices (36, 48, 60, and 72 months) by rounding the LOR to the nearest of these four choices. We set the most frequent choice, 48 months, as the base case and obtained the results summarized in Table 12a (for the choice of 36 months), Table 12b (for the choice of 60 months), and Table 12c (for the choice of 72 months). These results show that, other things being equal, as the bonus increases, the *relative* probability (or the relative risk ratio) of people choosing a shorter term contract (36 vs. 48 months) decreases and the *relative* probabilities of choosing a longer term contract (60 or 72 months vs. 48 months) increases. Longer reenlistment terms are also associated with certain demographic factors. Other factors remaining constant, members who are male, white, married, and have lower AFQT scores choose longer contract lengths than others. Finally, those who are in Zones B or C tend to choose longer contract lengths than those in Zone A.

Table 12a. Results from Multinomial Model (LOR=36 months)

Independent variable	Coefficient	z-stat
Bonus	-.0001408***	-30.48
Female	0.1883301***	8.45
AFQT	0.0035804***	8.30
Non-white	0.0553763***	3.31
Non-high school graduate	-0.3189131***	-2.99
GED	0.0795627	1.23
High school graduate	0.0327615	0.61
Some college	-0.1194836**	-2.12
College graduate	Omitted variable	
Single	0.0736387***	4.51
Married	Omitted variable	
Pre-drawdown	0.2160763***	10.38
Post-drawdown	0.229404***	13.45
Drawdown	Omitted variable	
Zone B	-0.5186359***	-28.73
Zone C	-0.8164958***	-34.57
Zone A	Omitted variable	
Constant	0.0074112	0.11

Table 12b. Results from Multinomial Model (LOR=60 months)

Independent variable	Coefficient	z-stat
Bonus	0.0001579***	26.09
Female	-0.1885473***	-3.44
AFQT	-0.0002038	-0.22
Non-white	-0.1118356***	-3.00
Non-high school graduate	0.1871566	0.91
GED	0.0776206	0.62
High school graduate	-0.1207198	-1.13
Some college	-0.2165567*	-1.94
College graduate	Omitted variable	
Single	-0.1095936***	-2.94
Married	Omitted variable	
Pre-drawdown	1.003847***	24.21
Post-drawdown	0.4219925***	10.65
Drawdown	Omitted variable	
Zone B	0.4153536***	10.23
Zone C	0.653715***	13.18
Zone A	Omitted variable	
Constant	-2.782946***	-20.90

Table 12c. Results from Multinomial Model (LOR=72 months)

Independent variable	Coefficient	z-stat
Bonus	0.0001947***	41.73
Female	-0.263057***	-7.54
AFQT	-0.0004527	-0.76
Non-white	-0.1017128***	-4.25
Non-high school graduate	-0.438795***	-2.73
GED	-0.3143119***	-4.08
High school graduate	-0.496712***	-7.88
Some college	-0.2432595***	-3.75
College graduate	Omitted variable	
Single	-0.2268228***	-8.91
Married	Omitted variable	
Pre-drawdown	1.436714***	53.36
Post-drawdown	0.6427517***	25.01
Drawdown		
Zone B	1.235115***	40.49
Zone C	2.149697***	63.76
Zone A	Omitted variable	
Constant	-2.319184***	-28.01
Pseudo R^2	0.0846	
Prob > χ^2	0.0000	

Ordered Logit Model

The ordered logit model differs from MLOGIT in that it treats values of the dependent variable as inherently rank-ordered while MLOGIT, motivated by a random utility model, treats them as merely different choices or outcomes. In our case, OLOGIT seems more appropriate as

the length of reenlistment is ordered in length.[12] Again we collapsed the lengths of reenlistment into four choices (36, 48, 60, and 72 months) and set 48 months as the base case. Table 13 reports the estimation results including the "cut points" and Table 14 gives the probabilities of each choice. From Table 13, we can see that bonus is positive significant. The same set of demographic features that are associated with higher relative probability of longer LOR are also associated with longer LOR in this model (i.e., male, white, lower AFQT, married, pre-drawdown, post-drawdown, Zone B, and Zone C).

Table 13. Results from Ordered Logit Model

Independent variable	Coefficient	z-stat
Bonus	0.0001933***	62.20
Female	-0.2728039***	-14.12
AFQT	-0.0033216***	-9.25
Non-white	-0.0895837***	-6.36
Non-high school graduate	0.0441664	0.50
GED	-0.1897568***	-3.66
High school graduate	-0.2912972***	-6.75
Some college	-0.0834035*	-1.86
College graduate	Omitted variable	
Single	-0.1511815***	-10.78
Married	Omitted variable	
Pre-drawdown	0.6154351***	36.77
Post-drawdown	0.0893996***	6.16
Drawdown	Omitted variable	
Zone B	0.8469606***	54.87
Zone C	1.655362***	86.17
Zone A	Omitted variable	
Pseudo R^2	0.0667	
Prob > χ^2	0.0000	
_cut1	-0.0925123	
_cut2	1.906766	
_cut3	2.264168	

Table 14. Probabilities of Each Choice Based on OLOGIT Estimates

LOR	Probability	Observed
36	Pr ($-\infty$ < xb+u <_cut1)	0.4032
48	Pr (_cut1< xb+u <_cut2)	0.3963
60	Pr (_cut2< xb+u <_cut3)	0.0458
72	Pr (_cut3< xb+u < $+\infty$)	0.1547

What Do These Models Predict?

Although comparing the level of significance and the signs of the estimated parameters across the four models is straightforward, comparing the estimated magnitude of the effect is not. The difficulty arises because the estimated coefficients from MLOGIT and OLOGIT models are not the marginal effects. To compare effects across models, we could simply calculate the

[12] Another desirable feature of OLOGIT is that, unlike the ordinary regression, assigning different values to choices/ outcomes (e.g., 1, 5, 10, 15, instead of 1, 2, 3, 4) will not change the parameter estimates as long as it preserves the rank order.

marginal effects of each parameter. However, it would be more useful for understanding if we generate predictions for a common population for each model, under a variety of scenarios, and compare the prediction results. For example, we could predict expected average LOR for a common population with different levels of SRB or with different percentages of the SRB's lump sum payment.

To facilitate comparison across models, we drew a representative group from our data based on the frequency distribution of various personal characteristics. In most cases, we chose the category that is the "mode" (i.e., that with the highest frequency). As a result, individuals with the following characteristics are "representative": male, white, married, AFQT=57, high-school graduate, grade=E4, years of service (YOS)=4, in Zone A, and in FY1996. Although characteristics such as grade, YOS, and FY are not in the models, they are taken into account to ensure that the "representative" cases obtain the same real present value of bonus with the same LOR when we predict under different levels of SRB. When we predicted under different percentages of lump sum payment, we had to specify SRB-award level to be used. The SRB-award level in this case is 0.5, and it is also the most frequent (modal) SRB.

We present the prediction results in Figure 1 and Figure 2. Figure 1 shows the predicted average LOR under different SRB award levels by different models. We observe that the predictions of all four models are very close and imply similar LOR effects with regard to the SRB level. Although OLOGIT seems to consistently generate the largest effects, the differences among the models are modest, 3.5 months at most. The Heckman selection model did seem to adjust downward the predictions from OLS, presumably by accounting for the selection process. But again, the difference in prediction is very small. One should also notice that all the relationships dissipate after SRB level 4. That is because the bonus for our "representative" case hits the ceiling of $20,000 at that level.

Figure 2 shows that the impact from changing the lump sum proportion of the payment is relatively small and again that the models' predictions are similar. However the lump sum payment effect depends on the assumption about the personal discount rate. If the personal discount rate is greater than 10%, we would observe a greater effect on contract length. If a higher discount rate were used, such as the 16% rate used in the calculation of the original ACOL variables, one would expect the slope of the lines to be slightly greater. This is because the future installments, to be received 4 or 5 years from the reenlistment decision, would be discounted at a higher rate. Individuals, at the margin, would choose lower reenlistment contract lengths to lessen this effect.

Figure 1. Average length of reenlistment with different SRB level predicted by different models.

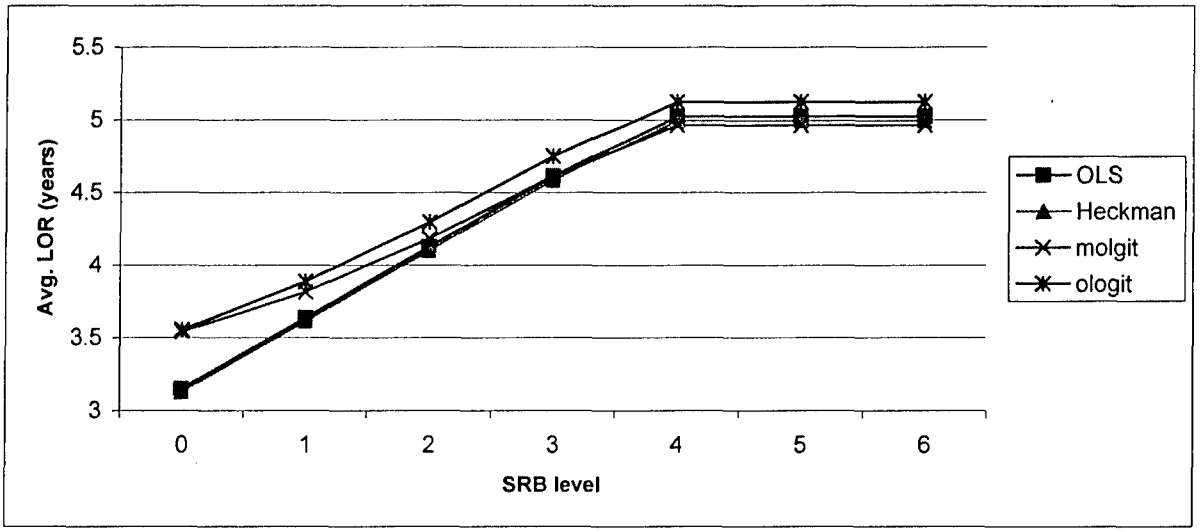
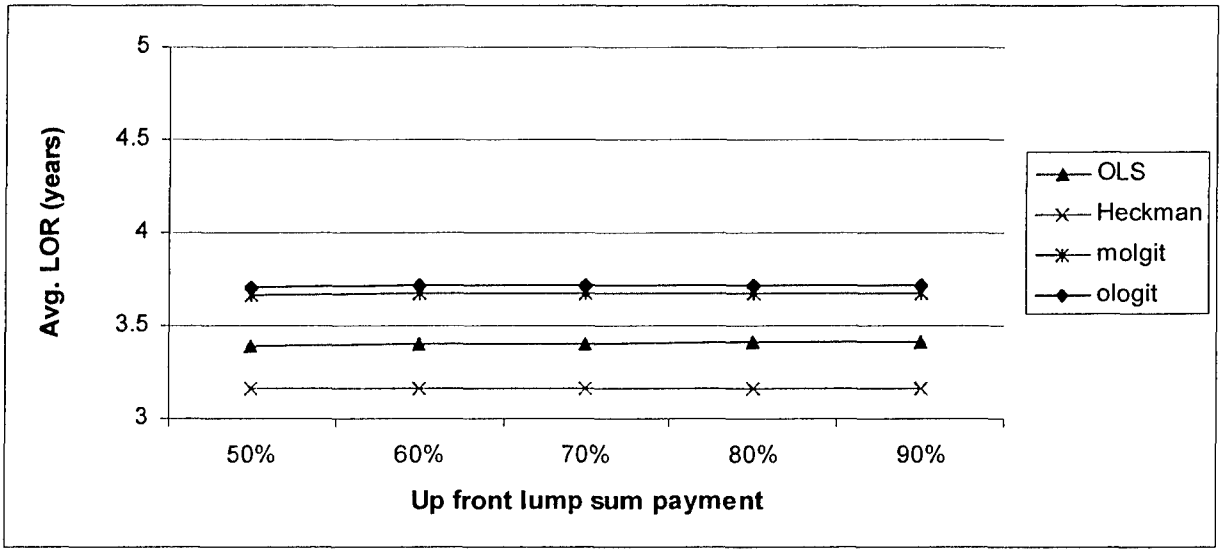


Figure 2. Average length of reenlistment with different percentage in lump sum payment predicted by different models.



A significant finding from comparing the models' prediction is that they all provide similar, reasonable predictions. This, together with the earlier finding that all models yielded significant and similar parameter estimates, suggest that the choice of which model to incorporate into the Army's SRB Management System to predict contract length can be based on which is the most convenient to code. No model appears to be significantly different from, or superior to, the others. There are some theoretical defects in some of the models. For example, OLS neglects the selection process and its associated effect. The Heckman model, on the other hand, takes the selection effect into account but might be flawed in assuming that the relationship between bonus and contract length is linear.

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Appendix: ACOL Coefficients

	ACOL Coefficients Zone			Unemployment Coefficients Zone		
MOS	A	B	C	A	B	C
00B	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
00D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
00E	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
00R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
00U	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
00Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
01H	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
02A	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02E	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02G	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02H	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02J	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02K	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02L	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02M	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02N	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02S	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02U	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
02Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
09B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
09C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
09D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
09R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
09S	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
09T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
09W	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
11B	0.000387‡	0.000302‡	0.000171‡	0.1323‡	0.0660‡	0.0000*
11C	0.000306‡	0.000296‡	0.000128†	0.0889†	0.1719‡	0.0000*
11H	0.000397†	0.000302†	0.000128†	0.0889†	0.0447†	0.0000*
11M	0.000415‡	0.000269‡	0.000095‡	0.0788‡	0.0447†	0.0000*
11X	0.000397†	0.000302†	0.000128†	0.0889†	0.0447†	0.0000*
11Z	0.000397†	0.000302†	0.000128†	0.0889†	0.0447†	0.0000*
12B	0.000215‡	0.000205‡	0.000108†	0.0299*	0.0145*	0.0000*
12C	0.000247†	0.000224†	0.000108†	0.0299*	0.0145*	0.0000*
12F	0.000247†	0.000224†	0.000108†	0.0299*	0.0145*	0.0000*
12Z	0.000247†	0.000224†	0.000108†	0.0299*	0.0145*	0.0000*
13B	0.000589‡	0.000260‡	0.000076†	0.0299*	0.0145*	0.0000*
13C	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
13D	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
13E	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
13F	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
13M	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
13N	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
13P	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
13R	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*

	ACOL Coefficients Zone			Unemployment Coefficients Zone		
MOS	A	B	C	A	B	C
13S	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
13T	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
13W	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
13X	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
13Z	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
14D	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
14E	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
14J	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
14L	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
14M	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
14R	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
14S	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
14T	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
14Z	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
15B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15E	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
15F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15G	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15H	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15J	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15K	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15M	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15N	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15P	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15Q	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15S	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15U	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15V	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15X	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15Y	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
15Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
16D	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
16E	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
16F	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
16J	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
16P	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
16R	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
16S	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
16T	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
16X	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
16Z	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
17B	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
18B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
18C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
18D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
18E	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
18F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
18X	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
18Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
19D	0.000678‡	0.000230‡	0.000124‡	0.1855‡	0.0145*	0.0000*

	ACOL Coefficients Zone			Unemployment Coefficients Zone		
MOS	A	B	C	A	B	C
19E	0.000510†	0.000253†	0.000129†	0.1065†	0.0145*	0.0000*
19K	0.000419‡	0.000292‡	0.000093‡	0.0748‡	0.0145*	0.0000*
19Z	0.000510†	0.000253†	0.000129†	0.1065†	0.0145*	0.0000*
21B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21E	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21G	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21H	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21J	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21K	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21L	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21M	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21N	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21P	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21Q	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21S	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21U	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21V	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21W	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21X	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21Y	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
21Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
23R	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
24C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
24G	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
24H	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
24K	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
24M	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
24N	0.000197†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
24R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
24T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25L	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25M	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25P	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25Q	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25S	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25U	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25V	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25W	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25X	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25Y	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
25Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*

	ACOL Coefficients Zone			Unemployment Coefficients Zone		
MOS	A	B	C	A	B	C
27D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27E	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27G	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27H	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27J	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27K	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27L	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27M	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27N	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27V	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27X	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
27Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29E	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29J	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29M	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29N	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29P	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29S	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29V	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29W	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29X	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29Y	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
29Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
31B	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31C	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31D	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31E	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31F	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31G	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31K	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31L	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31M	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31N	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31P	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31Q	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31R	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31S	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31T	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31U	0.000274‡	0.000209‡	0.000160‡	0.2506‡	0.3701‡	0.0000*
31V	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31W	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31Y	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
31Z	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
33M	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
33P	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
33Q	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
33R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
33T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
33V	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*

	ACOL Coefficients Zone			Unemployment Coefficients Zone		
MOS	A	B	C	A	B	C
33W	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
33Y	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
33Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35A	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35E	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35G	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
35H	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35J	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35K	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35L	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35M	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35N	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35P	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35Q	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35S	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35U	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
35V	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35W	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35Y	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
35Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
36L	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
36M	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
37F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
38A	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
39B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
39C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
39D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
39E	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
39G	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
39L	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
39V	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
39W	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
39X	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
39Y	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
41C	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
42A	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
42C	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
42D	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
42E	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
42F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
42L	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
42R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
42S	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
43E	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
43M	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
44B	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
44C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*

	ACOL Coefficients			Unemployment Coefficients		
	Zone			Zone		
MOS	A	B	C	A	B	C
44E	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
45B	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
45D	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
45E	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
45G	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
45K	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
45L	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
45N	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
45T	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
45Z	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
46N	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
46Q	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
46R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
46Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
51B	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
51G	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
51H	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
51K	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
51M	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
51R	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
51T	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
51Z	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
52C	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
52D	0.000260‡	0.000124‡	0.000053†	0.0299*	0.0145*	0.0000*
52E	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
52F	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
52G	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
52X	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
54B	0.000364‡	0.000222‡	0.000075*	0.0299*	0.0145*	0.0000*
55B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
55D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
55G	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
55R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
55X	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
55Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
56M	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
57E	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
57F	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
62B	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
62E	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
62F	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
62G	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
62H	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
62J	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
62N	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
63A	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63B	0.000195‡	0.000189‡	0.000053†	0.0299*	0.0145*	0.0000*
63D	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63E	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63G	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63H	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63J	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63M	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*

	ACOL Coefficients Zone			Unemployment Coefficients Zone		
MOS	A	B	C	A	B	C
63N	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63S	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63T	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63W	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63X	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63Y	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
63Z	0.000270†	0.000172†	0.000053†	0.0299*	0.0145*	0.0000*
67B	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
67G	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
67H	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
67N	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
67R	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
67S	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
67T	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
67U	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
67V	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
67X	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
67Y	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
67Z	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68B	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68D	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68F	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68G	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68H	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68J	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
68K	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68L	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68N	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68P	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68Q	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68R	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68S	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68X	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
68Y	0.000387†	0.000321†	0.000104†	0.0299*	0.3127†	0.0000*
71C	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
71D	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
71E	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
71G	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
71L	0.000463‡	0.000090‡	0.000075*	0.2033‡	0.1029‡	0.0000*
71M	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
72E	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
72G	0.000305†	0.000183†	0.000088†	0.0406†	0.0145*	0.0000*
73C	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
73D	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
73Z	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
74B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
74C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
74D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
74F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
74G	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
74Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
75B	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
75C	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*

	ACOL Coefficients Zone			Unemployment Coefficients Zone		
MOS	A	B	C	A	B	C
75D	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
75E	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
75F	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
75H	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
75Z	0.000448†	0.000109†	0.000075*	0.0816†	0.0456†	0.0000*
76C	0.000644†	0.000277†	0.000075*	0.1621†	0.0145*	0.0000*
76J	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
76P	0.000644†	0.000277†	0.000075*	0.1621†	0.0145*	0.0000*
76V	0.000644†	0.000277†	0.000075*	0.1621†	0.0145*	0.0000*
76X	0.000644†	0.000277†	0.000075*	0.1621†	0.0145*	0.0000*
76Y	0.000679‡	0.000327‡	0.000075*	0.1450‡	0.0145*	0.0000*
76Z	0.000644†	0.000277†	0.000075*	0.1621†	0.0145*	0.0000*
77F	0.000108‡	0.000240‡	0.000075*	0.0299*	0.0145*	0.0000*
77L	0.000124†	0.000243†	0.000075*	0.0299*	0.0145*	0.0000*
77W	0.000124†	0.000243†	0.000075*	0.0299*	0.0145*	0.0000*
79D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
79R	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
79S	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
79T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
79V	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
81B	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
81C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
81L	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
81Q	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
81T	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
81Z	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
82B	0.000374†	0.000193†	0.000075*	0.0299*	0.0145*	0.0000*
82C	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
82D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
83E	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
83F	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
88H	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88K	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88L	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88M	0.000240‡	0.000201‡	0.000075*	0.0299*	0.0145*	0.0000*
88N	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88P	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88Q	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88R	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88S	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88T	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88U	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88V	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88W	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88X	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88Y	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
88Z	0.000239†	0.000196†	0.000075*	0.0299*	0.0145*	0.0000*
89B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
89D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
91A	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91B	0.000323‡	0.000018‡	0.000079†	0.0299*	0.0724†	0.0000*
91C	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91D	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*

	ACOL Coefficients Zone			Unemployment Coefficients Zone		
MOS	A	B	C	A	B	C
91E	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91F	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91G	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91H	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91J	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91K	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91L	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91M	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91N	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91P	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91Q	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91R	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91S	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91T	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91U	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91V	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91W	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91X	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91Y	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
91Z	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
92A	0.000198‡	0.000229‡	0.000075*	0.3552‡	0.1065†	0.0000*
92B	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
92E	0.000458†	0.000154†	0.000079†	0.0299*	0.0724†	0.0000*
92F	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
92G	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
92L	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
92M	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
92R	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
92S	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
92W	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
92Y	0.000178†	0.000230‡	0.000158‡	0.2554†	0.2732‡	0.3388‡
92Z	0.000178†	0.000178†	0.000075*	0.2554†	0.1065†	0.0000*
93B	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
93C	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
93D	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
93F	0.000399†	0.000254†	0.000076†	0.0299*	0.0145*	0.0000*
93P	0.000361*	0.000209*	0.000075*	0.0299*	0.0145*	0.0000*
94A	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94B	0.000697‡	0.000261‡	0.000185‡	0.1482‡	0.0145*	0.0000*
94D	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94E	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94F	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94H	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94K	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94L	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94M	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94P	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94R	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94S	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94T	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94V	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94W	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
94Y	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*

	ACOL Coefficients Zone			Unemployment Coefficients Zone		
MOS	A	B	C	A	B	C
94Z	0.000688†	0.000258†	0.000186†	0.1439†	0.0145*	0.0000*
95B	0.000253‡	0.000196‡	0.000108‡	0.0299*	0.2229‡	0.0000*
95C	0.000291†	0.000206†	0.000136†	0.0299*	0.2140†	0.0000*
95D	0.000291†	0.000206†	0.000136†	0.0299*	0.2140†	0.0000*
96B	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
96D	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
96F	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
96H	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
96R	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
96U	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
96Z	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
97B	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
97E	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
97G	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
97L	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
97Z	0.000170†	0.000161†	0.000203†	0.0299*	0.1316†	0.0000*
98C	0.000270†	0.000153†	0.000177†	0.1546†	0.0145*	0.0000*
98D	0.000270†	0.000153†	0.000177†	0.1546†	0.0145*	0.0000*
98G	0.000270†	0.000153†	0.000177†	0.1546†	0.0145*	0.0000*
98H	0.000270†	0.000153†	0.000177†	0.1546†	0.0145*	0.0000*
98J	0.000270†	0.000153†	0.000177†	0.1546†	0.0145*	0.0000*
98K	0.000270†	0.000153†	0.000177†	0.1546†	0.0145*	0.0000*
98P	0.000270†	0.000153†	0.000177†	0.1546†	0.0145*	0.0000*
98X	0.000270†	0.000153†	0.000177†	0.1546†	0.0145*	0.0000*
98Y	0.000270†	0.000153†	0.000177†	0.1546†	0.0145*	0.0000*
98Z	0.000270†	0.000153†	0.000177†	0.1546†	0.0145*	0.0000*

* = Coefficient based on all-Army model
† = Coefficient based on CMF-specific model
‡ = Coefficient based on MOS-specific model